

that is from the even breaking off of the stick, the solid *interstitia* having a regular termination or surface, and having a pretty strong reflecting quality, the many small reflections become united to the naked eye, and make a very pretty shining surface.

Thirdly, the reason of its hardness and brittleness seems evident, for since all the watery or liquid substance that moistn'd and toughn'd those *Interstitia* of the more solid parts, are evaporated and remov'd, that which is left behind becomes of the nature almost of a stone, which will not at all, or very little, bend without a *divulsion* or *solution* of its continuity.

It is not my design at present, to examine the use and *Mechanisme* of these parts of Wood, that being more proper to another Enquiry; but rather to hint, that from this Experiment we may learn,

First, what is the cause of the blackness of many burnt bodies, which we may find to be nothing else but this; that the heat of the fire agitating and rarifying the waterish, transparent, and volatile water that is contain'd in them, by the continuation of that action, does so totally expel and drive away all that which before fill'd the pores, and was dispers'd also through the solid mass of it, and thereby caus'd an universal kind of transparency, that it not onely leaves all the pores empty, but all the *Interstitia* also so dry and *opacous*, and perhaps also yet further perforated, that that light onely is reflected back which falls upon the very outward edges of the pores, all they that enter into the pores of the body, never returning, but being lost in it.

Now, that the Charring or coaling of a body is nothing else, may be easily believ'd by one that shall consider the means of its production, which may be done after this, or any such manner. The body to be charr'd or coal'd, may be put into a *Crucible*, *Pot*, or any other Vessel that will endure to be made red-hot in the Fire without breaking, and then cover'd over with Sand, so as no part of it be suffer'd to be open to the Air, then set into a good Fire, and there kept till the Sand has continu'd red hot for a quarter, half, an hour or two, or more, according to the nature and bigness of the body to be coal'd or charr'd, then taking it out of the Fire, and letting it stand till it be quite cold, the body may be taken out of the Sand well charr'd and cleans'd of its waterish parts; but in the taking of it out, care must be had that the Sand be very neer cold, for else, when it comes into the free air, it will take fire, and readily burn away.

This may be done also in any close Vessel of Glass, as a *Retort*, or the like, and the several fluid substances that come over may be receiv'd in a fit *Recipient*, which will yet further countenance this *Hypothesis*: And their manner of charring Wood in great quantity comes much to the same thing, namely, an application of a great heat to the body, and preserving it from the free access of the devouring air; this may be easily learn'd from the History of Charring of Coal, most excellently describ'd and publish'd by that most accomplish'd Gentleman, Mr. John Evelyn, in the 100, 101, 103, pages of his *Sylva*, to which I shall therefore refer the curious Reader that desires a full information of it.

Next

Next, we may learn what part of the Wood it is that is the *combustible* matter; for since we shall find that none, or very little of those fluid substances that are driven over into the Receiver are *combustible*, and that most of that which is left behind is so, it follows, that the solid *interstitia* of the Wood are the *combustible* matter. Further, the reason why uncharr'd Wood burns with a greater flame then that which is charr'd, is as evident, because those waterish or volatil parts issuing out of the fired Wood, every way, not onely shatter and open the body, the better for the fire to enter, but issuing out in vapours or wind, they become like so many little *aeolipiles*, or Bellows, whereby they blow and agitate the fir'd part, and conduce to the more speedy and violent consumption or dissolution of the body.

Thirdly, from the Experiment of charring of Coals (whereby we see that notwithstanding the great heat, and the duration of it, the solid parts of the Wood remain, whilst they are preserv'd from the free access of the air undissipated) we may learn, that which has not, that I know of, been publish'd or hinted, nay, not so much as thought of, by any; and that in short is this.

First, that the Air in which we live, move, and breath, and which encompasses very many, and cherishes most bodies it encompasses, that this Air is the *menstruum*, or universal dissolvent of all *sulphureous* bodies.

Secondly, that this action it performs not, till the body be first sufficiently heated, as we find requisite also to the dissolution of many other bodies by several other *menstruums*.

Thirdly, that this action of dissolution, produces or generates a very great heat, and that which we call Fire; and this is common also to many dissolutions of other bodies, made by *menstruums*, of which I could give multitudes of Instances.

Fourthly, that this action is perform'd with so great a violence, and does so minutely act, and rapidly agitate the smallest parts of the *combustible* matter, that it produces in the *diaphanous medium* of the Air, the action or pulse of light, which what it is, I have else-where already shewn.

Fifthly, that the dissolution of sulphureous bodies is made by a substance inherent, and mixt with the Air, that is like, if not the very same, with that which is fixt in *salt-peter*, which by multitudes of Experiments that may be made with *salt-peter*, will, I think, most evidently be demonstrated.

Sixthly, that in this dissolution of bodies by the Air, a certain part is united and mixt, or dissolv'd and turn'd into the Air, and made to fly up and down with it in the same manner as a *metalline* or other body dissolv'd into any *menstruum*, does follow the motions and progresses of that *menstruum* till it be precipitated.

Sevently, That as there is one part that is dissoluble by the Air, so are there other parts with which the parts of the Air mixing and uniting, do make a *Coagulum*, or *precipitation*, as one may call it, which causes it to be separated from the Air, but this *precipitate* is so light, and in so small and rarify'd or porous clusters, that it is very volatil, and is easily carry'd up by the motion of the Air, though afterwards, when the heat and agitation